**Draft plan for application of aerosol and chemistry models to the AMMA IOPs**
**(WP4.1.3: Modelling the interactions between aerosols/chemistry and the atmosphere)**
*Peter van Velthoven – 18 May 2007*

It is proposed to produce the following output from the chemistry and aerosol models for at least the golden days, but preferably July-August 2006 or from January 2006 if feasible.
A golden days list will be provided by Claire Reeves. High resolution models will likely only simulate the selected golden days, global models can provide the whole of 2006. If possible, provide the monthly mean meridional cross section not only for 2006 but also for 2000 and 2003.

Emissions

- Use the best emissions you have globally/regionally for the simulated year.
  Biomass burning emissions will be provided by Cathy Liousse (LA).
  To be completed …. (Fossil fuel and biofuel emissions are also in preparation)
- An additional tracer (AT) for convective transport with a lifetime of 5 days. Emit in total 1 Tg/year between the surface and 850hPa in the regions 5N-30N, 20W-40E and 30S-5N,10E-40E (Africa).

Obligatory output
- A monthly mean, meridional vertical cross section (apart from 2006, also for 2000, 2003, if possible).
  - between 20 S and 40 N (or shorter if your model has a more limited latitudinal domain)
  - representative of (averaged over) 10W-10E
  - for AT, CO, O3, NOx (NO+NO2), and OH, aerosols?.
  This corresponds to the "cross"-output of the AMMA MIP for dynamical models, see
  http://amma-mip.lmd.jussieu.fr/
  This can be provided on pressure or model levels. In case of model levels please also provide the pressure variable.
Additional output for 2006:
- Chemical constituents at the locations of the aircraft (time resolution: every whole minute) for point-to-point comparisons.
  Files with aircraft location (longitude (degr E), latitude (degr N), pressure (hPa) and time (hours & minutes UT) are already available for the DLR Falcon and the French ATR and Falcon aircraft at
  http://www.knmi.nl/samenw/campaign_support/AMMA/TRACKDATA/index.html
  John Methven and Francisco Cairo are to provide similar files for the BAE and Geophysiciae. It is planned that these files are complemented with T (K), U-wind (m/s), V-wind (m/s), water vapour mixing ratio (ppmv) or RH (%), so that the representativity of the model simulated meteorological fields can be assessed.
  Requested model output at these points: date+UT (minutes), T(K), U, V, RH, H2O, O3, NO2, NO, HNO3, OH, CO, AT, isoprene, …
- Daily tropospheric columns 2D-field of NO2 and HCHO at the local overpass time of Sciamachy (10h00 LT) and OMI (13h30 LT).
- AT and CO output fields at 700, 850, 500, 350 hPa (at 10h30 LT?) for comparison with MOPITT
- Output at 8 IDAF sites:

Banizoumbou (13.54N,2.66E in Niger), Hombori (15.2 N, 1.3 W in Mali), Lamto (6N, 5 W in Ivory Coast), Djougou (9.66 N, 1.91E in Benin), Zoétélé (3.16N,11.96E in Cameroon), Louis Trachardt (South Africa), Amersfoort (South Africa), Cape Point (South Africa) – **coordinates to be completed**
Output: monthly mean SO2, NO2, HNO3, NH3, O3, OC, BC

- Ozone, CO and AT profiles at Windhoek (about 17. 5 E, 22.5 S – **to be precised**) for comparison to MOZAIC Air Namibia flights (twice daily). Please also include pressure (hPa) in the output. **Hours to be defined**.
- Ozone profiles at Cotonou (6.21 N, 2.23 E). Please also include pressure (hPa) in the output. **A date list to be provided.**
- Aerosol optical depth at 12h UT at AERONET sites Agoufou (15.34N, 1.48W) in Mali, Capo Verde (16.73N, 22.93W), Banizoumbou (13.54N,2.66E) in Niger, Dahkla (23.71N,15.95W) in Morocco, Dakar (14.39N,16.96W) in Senegal, Djougou (9.66 N, 1.91E) inn Benin, IER-Cinzana (13.28N,5.93W) in Mali, Illorin (8.32N, 4.34E) in Nigeria, and Ouagadougou (12.20N, 1.40W ) in Burkina Faso

The preferred output format is netcdf. Time series and profile data may also be provided in ascii. Please stick to CF convention as much as possible. See examples at
http://wiki.esipfed.org/index.php/CF_Standard_Names_-_Accepted_names_for_TF_HTAP

KNMI (Peter van Velthoven) and Un. Reading (John Methven) will provide backward trajectories from the aircraft locations based on ECMWF, possibly including convective cloud encounters derived from MSG. See
http://www.knmi.nl/samenw/campaign_support/AMMA/TRAJ/index.html

Involved European models and contacts

| Model | Domain | Type | Contacts | Mail |
|---|---|---|---|---|
| TM4/5 | global | Chemistry | Peter van Velthoven, KNMI | velthove@knmi.nl |
| Meso-NH | Regional | Chemistry | Céline Mari, Claire Delon, LA | marc@aero.obs-mip.fr delc@aero.obsip.fr |
| RegCM | Regional | Chemistry, aerosols | Cathy Liousse, LA | Catherine.Liousse@aero.obs-mip.fr |
| TM4-ORISAM | Global | Aerosol | Cathy Liousse, LA | Catherine.Liousse@aero.obs-mip.fr |
| Mocage | Global | Chemistry | Jean-Luc Attié, LA Béatrice Josse, CNRM | attjl@aero.obs-mip.fr Beatrice.Josse@meteo.fr |
| LM | Regional | Chemistry | Bernhard Vogel, Karlsruhe | Bernhard.vogel@imk.fzk.de |
| BOLAM | Regional | Chemistry ? | Federico Fierli ?, CNR ISAC | f.fierli@isac.cnr.it |
| LMDZ-INCA | | Chemistry, aerosols | Kathy Law (I. Bouarar), IPSL | kathy.law@aero.jussieu.fr |
| Chimere | Regional | Aerosols, chemistry | Schmechtig?,Marticorena?,LISA | schmechtig@lisa.univ-paris12.fr marticorena@lisa.univ−paris12.fr |
| pTOMCAT | Global | Chemistry | Xin Yang (Un.Cambridge) | Xin.Yang@atm.ch.cam.ac.uk |